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10/546,133	08/19/2005	Stefan Grau	3926.198	9908

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EXAMINER	
AUSTIN, AARON	

ART UNIT	PAPER NUMBER
1794	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/546,133	GRAU ET AL.	
	Examiner	Art Unit	
	AARON S. AUSTIN	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☒ Claim(s) *1,2,4,5 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *8/19/05* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/11/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 1-2, 4, 5, and 12 are objected to because of the following informalities: the claims do not provide line indentations between each element for the sake of clarity. Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. 37 CFR 1.75(i), MPEP 608.01(m). Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, at lines 8-9 the claim recites “more than 70%” without providing whether the percentage is by weight or volume. Appropriate correction is required.

Regarding claim 12, at lines 1-2 the claim recites “A composite material…by depositing”. This claim language is indefinite as it does not describe the relationship between the claimed material and the act of deposition. Amending the claim to read " A composite material...formed by depositing" or the like will overcome the rejection. Appropriate correction is required.

Regarding claim 12, at lines 8-9 the claim recites "more than 70%" without providing whether the percentage is by weight or volume. Appropriate correction is required.

The remaining claims are rejected as being dependent on a rejected claim.

Claim Rejections - 35 USC § 102 and 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 6-17, and 19-22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Haug et al. (US 2002/0034643).

Haug et al. teach a process for producing a composite material and the product made thereby comprising metallic, intermetallic, and ceramic phases (paragraph [0007]). The process may include arc wire spraying (paragraph [0014]) which results in reaction during depositing to form the intermetallic phase (paragraph [0013]). Arc wire spraying necessarily includes use of two wires comprising a composite wire of metal or

a metal alloy to induce the short that causes the welding action to occur. Further, ceramic particles are taught as being present when arc wire welding is used (paragraph [0015]).

Haug et al. do not specifically teach the amount of ceramic particles and metal or metal alloy that react to form the composite.

However, as Haug et al. teach the same components claimed (metal or metal alloy wire and ceramic particles) used in the same manner claimed (arc wire spraying), it is expected that the components will interact in the same manner as claimed. Thus the amount of interaction between the ceramic particles and metal or metal alloy is expected to be in the ranges claimed. Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 USPQ 431 (CCPA 1977).

In the alternative, it would have been obvious to one having ordinary skill in the art at the time of the invention to adjust the amount of the components and thus adjust the reactivity thereof to achieve desired adherence for the intended application, since it

has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 2, arc wire spraying necessarily includes use of two wires comprising a composite wire of metal or a metal alloy to induce the short that causes the welding action to occur. The metal of the second wire will interact with the ceramic powder taught by Haug et al. as like materials are used in a like manner as claimed.

Regarding claim 3, exothermic heat will develop as a result of the interaction as like materials are used in a like manner as claimed and per the laws of thermodynamics.

Regarding claim 4, the composite wire of the arc wire spraying method taught uses aluminum or iron as the metal material for the wire (paragraphs [0012] and [0014]) and titanium oxide as the ceramic powder component (paragraph [0011]).

Regarding claim 6, it would have been obvious to one having ordinary skill in the art at the time of the invention to adjust the amount of the ceramic component and thus adjust the reactivity thereof to achieve desired adherence for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 7 and 13, the intermetallic phase includes titanium and either aluminum or iron (claim 1, paragraphs [0011]-[0012]).

Regarding claims 8 and 15-16, aluminum oxide forms due to the reaction (claim 8).

Regarding claims 9-10, reactive plasma gas is supplied and expected to react as claims as like materials are used in a like manner to the claims (paragraph [0020]).

Regarding claim 11, the aluminum is converted to aluminum oxide in the transition material forming the composite material.

Regarding claim 14, as like materials are formed in a like manner, titanium aluminide is expected to form as claimed.

Regarding claim 17, Haug et al. do not teach the porosity of the product. However, as like materials are formed in a like manner, the porosity is expected to be as claimed.

Regarding claim 19, Haug et al. do not teach the content of free metallic aluminum of the product. However, as like materials are formed in a like manner, the content of free metallic aluminum is expected to be as claimed.

Regarding claim 20, Haug et al. do not teach the thickness of the applied layer. However, it would have been obvious to one having ordinary skill in the art at the time of the invention to adjust the thickness for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 21, the layer formed may serve as protection against wear (paragraph [0008]). Thus the layer is suitable for the claimed intended use.

Regarding claim 22, the composite material would provide some level of protection against ballistic effect.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haug et al. (US 2002/0034643) in view of Haug et al. (US 2002/0028342).

Haug et al. '643 teach a process for producing a composite material and the product made thereby as discussed above.

Haug et al. '643 do not teach coated or jacketed wires for use the arc wire spraying process.

Haug et al. '342 teach a material wire for use in arc wire spraying comprising a metallic coating and ceramic filler (e.g., claims 1 and 4). Therefore, as Haug et al. '342 clearly teaches a material wire comprising a metallic coating and ceramic filler provides the advantage of a particularly good wire for making coating on cylinder running surfaces (paragraph [0075]), it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to use a wire comprising a metallic coating and a ceramic filler as at least one of the wires of the arc wire spraying method of Haug et al. '643 which is applied to a cylinder (see the Examples).

Claims 1-4, 6-17, and 19-22 are rejected under 35 U.S.C. 103(a) as obvious over Haug et al. (US 2002/0034643) in view of Claussen et al. (US 6,025,065).

Haug et al. teach a process for producing a composite material and the product made thereby as described above.

Haug et al. do not specifically teach the amount of ceramic particles and metal or metal alloy that react to form the composite.

In addition to the arguments set forth above, Claussen et al. teach a ceramic formed body comprising 5 to 70 vol. % of at least one intermetallic phase and 30 to 95 vol. % of one or more ceramic phases results in a strong and non-brittle product (column 3, lines 28-62). These amounts overlap that taught by Applicant (e.g., present claim 17). Therefore, as Claussen et al. clearly teach a ceramic formed body comprising 5 to 70 vol. % of at least one intermetallic phase and 30 to 95 vol. % of one or more ceramic phases provides the advantage of a strong and non-brittle product (column 3, lines 28-62), it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form the composite material of Haug et al. with intermetallic and ceramic phases within the ranges taught by Claussen et al.

Therefore, as Haug et al. in view of Claussen et al. teach the same components claimed (metal or metal alloy wire and ceramic particles), in overlapping proportions (as taught by Claussen), used in the same manner claimed (arc wire spraying), it is expected that the components will interact in the same manner as claimed. Thus the amount of interaction between the ceramic particles and metal or metal alloy is expected to be in the ranges claimed.

Regarding claim 17, Haug et al. in view of Claussen et al. does not teach the porosity of the product. However, as like materials in like proportions are formed in a like manner, the porosity is expected to be as claimed.

Regarding claim 19, Haug et al. in view of Claussen et al. does not teach the content of free metallic aluminum of the product. However, as like materials in like

proportions are formed in a like manner, the content of free metallic aluminum is expected to be as claimed.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haug et al. (US 2002/0034643) in view of Claussen et al. (US 6,025,065) as described above, and further in view of Haug et al. (US 2002/0028342).

Haug et al. '643 in view of Claussen et al. teach a process for producing a composite material and the product made thereby as discussed above.

Haug et al. '643 in view of Claussen do not teach coated or jacketed wires for use the arc wire spraying process.

Haug et al. '342 teach a material wire for use in arc wire spraying comprising a metallic coating and ceramic filler (e.g., claims 1 and 4). Therefore, as Haug et al. '342 clearly teaches a material wire comprising a metallic coating and ceramic filler provides the advantage of a particularly good wire for making coating on cylinder running surfaces (paragraph [0075]), it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to use a wire comprising a metallic coating and a ceramic filler as at least one of the wires of the arc wire spraying method of Haug et al. '643 which is applied to a cylinder (see the Examples).

Allowable Subject Matter

Claim 18 would be allowable if rewritten to overcome the objections as well as the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach or provide motivation to form a composite material comprising a composition of elements structurally related as set forth in claim 18. Specifically, the prior art fails to teach or provide motivation to form a composite comprising the metallic, intermetallic, and ceramic phases as set forth in claim 12 wherein the intermetallic phase is of titanium aluminides and nickel aluminides in the range claimed, the ceramic phases is aluminum oxide in the range claimed, and the porosity is as claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AARON S. AUSTIN whose telephone number is

(571)272-8935. The examiner can normally be reached on Monday-Friday: 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John J. Zimmerman/
Primary Examiner, Art Unit 1794

/Aaron Austin/